

Title: Green Chemistry: Sustaining an High Technology Civilization

Abstract:

Over the last century, science and technology have given humanity vast and unprecedented powers over the welfare of the ecosphere. While we have gained innumerable benefits, the downsides of myriad chemical technologies are now haunting us and are shaking our confidence in the long-term viability of what we have built. The term “sustainability” captures this insecurity. The underlying chemical technology reasons for our sustainability dilemma will be reviewed in a historical context [1, 2]. Most importantly, in our increasingly crowded world, common chemicals that once seemed harmless clearly are not, calling for a tectonic shift in the ways that the chemical enterprise thinks, plans and functions [3,4]. As “the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances [Paul Anastas’ original definition]”, green chemistry is critical to any viable strategy for building the technological dimension of a sustainable civilization. The field of green chemistry is expanding and chemists are turning their inventive talents towards eliminating hazards to acknowledge our obligations to future humanity and to build a greener economy. But we have much to learn if we are going to be fully successful. Examples of green chemistry developments will be presented with an emphasis on achievements in our Carnegie Mellon University laboratories [5, 6]. At the same time, the chemical enterprise is burdened by structural components that protect and enforce a money-first-in-all-things ethos. With certainty of assertion, these are militating against our finding pathways to a sustainable future for mankind. Since the welfare of our species and all other living things is on the chopping block because of recently understood low dose adverse effects of incumbent chemical products, these forces must be effectively challenged from both within and outside the chemical enterprise. In our quest for a sustainable future, trans-generational justice must take the center of our civilization’s ethical stage.

References

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